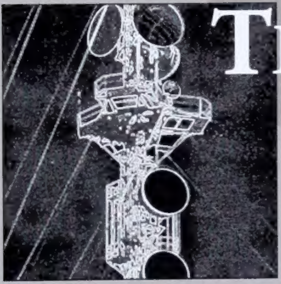
AL.1.968 c2

ALBERTA

TECHNOLOGY

RESEARCH AND



TELECOMMUNICATIONS

1990 - 1991
Annual Report

Digitized by the Internet Archive
in 2014

https://archive.org/details/albertatech199091

Alberta
TECHNOLOGY, RESEARCH
AND TELECOMMUNICATIONS

Office of the Minister

403 Legislature Building, Edmonton, Alberta, Canada T5K 2B6 403/422-5982 Fax 403/422-6040

CANADIANA

JUL 14 1992

May 18, 1992

The Honourable Dr. David J. Carter
Speaker of the Legislative
Assembly of Alberta
325 Legislature Building
Edmonton, Alberta
T5K 2B6

Dear Sir:

I have the honour to submit the Annual Report for the Department of Technology, Research and Telecommunications for the year ending March 31, 1991.

Respectfully submitted,

Fred A. Stewart
Minister

Alberta
TECHNOLOGY, RESEARCH
AND TELECOMMUNICATIONS

Office of the Deputy Minister

12th Floor, Pacific Plaza, 10909 Jasper Avenue, Edmonton, Alberta T5J 3M8 Direct Line 403/422-0063 Fax 403/427-5801

May 18, 1992

The Honourable Fred A. Stewart
Minister of Technology, Research
and Telecommunications
403 Legislative Building
Edmonton, Alberta
T5K 2B6

Dear Mr. Stewart:

I have the honour to submit the Annual Report for the Department of Technology, Research and Telecommunications for the year ending March 31, 1991.

Respectfully submitted,

Ken H.G. Broadfoot
Deputy Minister

MINISTER'S MESSAGE

Alberta's strong science culture

1990-91 was a very exciting year as Alberta's advanced technology community continued to make innovative discoveries and compete successfully on a global scale, helping to realize the Government's commitment to economic growth and development.

As important as these achievements were, it was even more exciting for me as Minister to be part of a dynamic new vision in Alberta's technology community - the development of a strong science culture with an emphasis on having all Albertans understand and appreciate the social and economic benefits of our investment in science and technology.

At the request of Premier Don Getty, the Premier's Council on Science and Technology was formed in May, bringing together individuals representing Alberta's research community, advanced technology industries, academia and business to act as advisors to the Government on science and technology issues facing Alberta in the future. This type of community involvement will set the standard for Alberta's success in world markets and help to build a solid foundation of prosperity for future generations.

In addition to seeking the advice of the Premier's Council, 1990-91 was a year where the Department endeavored to promote science to a new audience - students. In an effort to reach out to our scientists, engineers and technicians of the future, TR&T launched the successful Science City campaign. With the co-operation of research institutes, industry, business, and academia, students and the public were able to participate in several new initiatives across the province.

Science City News, an upbeat and informative newsletter designed for all Albertans, was launched as a quarterly publication. Issues featured interesting stories on the ingenuity and accomplishments of Alberta's technology entrepreneurs and helped to promote science and technology events in the community.

In addition, the Department initiated Alberta Science and Technology Week in May and encouraged business and industry to offer public open houses and science awareness events. The highlight of the week was a public salute to Alberta's brightest lights in technology with the Department's sponsorship of the first annual Alberta Science and Technology Leadership (ASTech) Awards held in Edmonton.

All in all, it was a very busy and productive year for Alberta's advanced technology community. It is with great pride that I present to you the contents of the 1990-91 annual report which summarizes the activities of the Department and provincial scientific activities.

Fred A. Stewart
Minister

OVERVIEW

Technology development has assumed economic importance in two distinct, but mutually reinforcing, senses. First, the application of advanced technologies is clearly acknowledged as a means of enhancing productivity within traditional industrial sectors. Secondly, advanced technologies offer unique potential as the basis on which entirely new industries can be developed. Viewed from this perspective, technology development can be seen as serving two fundamental economic objectives. As a means of enhancing productivity within existing industries, it serves the objective of economic growth; and, as the basis for the development of new industries, it serves the objective of economic diversification.

The influence of advanced technologies is absolutely pervasive. The development and application of advanced technologies affects every sector of the economy: agriculture, mining, manufacturing, even finance and retail trade. Emerging technologies are shaping workforce demands and, by association, education and training programs. The influence of advanced technologies is also becoming apparent in the public policy agenda, notably in areas such as health care and the environment. Moreover, this pervasive influence is by no means unique to Alberta; technology development is truly an international phenomenon and, as such, is affecting trade patterns, foreign exchange rates and the competitive advantage of nations.

MISSION STATEMENT

Since its inception in 1986, the primary focus of Technology, Research and Telecommunications (TR&T) has been to exploit the economic diversification and growth potential associated with advanced technologies. This focus is reflected in two distinct thrusts which constitute the Department's mission statement. More specifically, the Department's mission is to contribute to the growth and diversification of the Alberta economy by:

- supporting the creation and expansion of technology-intensive industrial clusters, notably in the fields of: advanced materials, biotechnology, telecommunications, electronics, environmental technologies, information technologies, and medical devices; and
- encouraging the application of advanced technologies in traditional resource industries and manufacturing.

Success in fulfilling this mission would be indicated by an increase in the number of technology-intensive companies in the province; an increase in the size of such companies in terms of revenue, employment, investment, exports, etc.; an increase in the aggregate size of these companies relative to the economy as a whole; and an increase in the utilization of state-of-the-art technologies in traditional economic sectors.

DEPARTMENT GOALS

While the Department's mission is described in terms of "industrial clusters" and "industries", Technology, Research and Telecommunications embraces four broad goals which are widely acknowledged as being critical to any modern technology development strategy. Reflecting the same tenor as the National Science and Technology Action Plan, these goals are:

- to support company formation and development;
- to build technology infrastructure within the province;
- to support human resource development;
- to build a general public awareness of the importance of technology development.

DEPARTMENT POLICIES

The policies of Technology, Research and Telecommunications have traditionally concentrated financial support on selected segments of the "innovation spectrum". The "innovation spectrum" is a concept which suggests that the development of technology-intensive products/processes is a cumulative process built upon basic research, applications research and development, the transfer of research results to commercial enterprises, product development, and ultimately commercialization. Consequently, the Department's policies have been designed to provide support for:

- basic research aimed at advancing the body of scientific knowledge which serves as the foundation for virtually all technology-intensive products and services;
- applied research and development aimed at converting knowledge into new or improved products and processes; this is frequently accomplished by marrying the universities' knowledge base with the commercial motives of industry in a research centre;
- technology transfer of knowledge into the hands of entrepreneurs and industry, be it from universities, public research institutions, or foreign sources;
- specialty state-of-the-art facilities which are relevant to local industry but which lie beyond the financial means of any individual firm;
- development, expansion or establishment of companies which constitute Alberta's technology-intensive industrial cluster and, which for the purposes of appropriate treatment, can be segregated into three categories:
    - (a) emerging companies - indigenously Alberta enterprises needing assistance to bring first products to market;
    - (b) threshold companies - those facing the proposition of having to "bet their existence" on expanding proven technology capabilities to second generation products and global competition;
    - (c) strategically significant companies - typically large trans-nationals whose presence in Alberta would have major positive impact vis-a-vis local suppliers, research competence, and identified spin-off benefits;
- corporate venturing and forging linkages between universities, industry and government which are necessary for optimal economic progress (i.e. pre-competitive joint research ventures, co-operative projects among the Western provinces);
- technology adaptation aimed at increasing the utilization of advanced technologies in traditional industries and areas that are of emerging public significance (e.g. the environment).

BUSINESS DEVELOPMENT & MARKETING DIVISION

The Department has identified a number of advanced technology sectors in which Alberta may be competitive on a worldwide basis. These are:

- electronics;
- information technologies;
- telecommunications;
- medical and biological sciences;
- advanced materials and processes; and
- advanced manufacturing technologies.

The Business Development & Marketing Division is responsible for promoting these areas and assisting Alberta companies to develop new and innovative products which have local and international market potential.

The Division administers a $2 million Technology Commercialization Program which provides financial assistance to private sector requests for the support of institutes, development of new products, commercialization of research and feasibility studies.

Electronics/Microelectronics

The Electronics/Microelectronics Section is responsible for assisting Alberta industry with incorporating and developing new electronic and microelectronic products. The industry is well supported by Alberta's advanced technology infrastructure which includes "building block" facilities such as the Electronics Test Centre, the Alberta Microelectronic Centre (AMC) and The LASER Institute.

During the past year, Business Development and Marketing has began implementing changes to the Alberta technology infrastructure as recommended by SRI International. These changes included reconfiguring the AMC fabrication facility and thin film laboratory into a micro-fabrication research and development laboratory. As a result of this development, greater collaboration between the AMC and the Alberta Telecommunications Research Centre photonics group is expected. Further changes are expected by The LASER Institute which will focus more effort towards industrial-related manufacturing problems.

Other initiatives included the establishment of successful relationships with other inter-provincial technology institutes. These efforts have encouraged resource pooling on joint projects. Additionally, efforts have been made towards the development of strategic alliances between Alberta industry and international companies to improve export market opportunities.

Telecommunications

The telecommunications industry is a strategically important area for economic growth and diversification. Alberta has a mature telecommunications infrastructure and an internationally recognized industry at the forefront of technology.

The Telecommunications Section is responsible for attracting new companies providing telecommunications services and products, and for the promotion of strategic alliances with new and existing companies. This section is also constantly reinforcing Alberta's commitment to existing companies.

Initiatives in the past year concentrated on fulfilling these responsibilities as well as assisting in obtaining additional sponsors for the Alberta Telecommunications Research Centre. Staff members also co-ordinated the activities of a Provincial Telecommunications Industrial Committee consisting of representatives from industry and government.

Medical and Biological Sciences

Alberta's biomedical research and development infrastructure is among the best supported of any equivalent jurisdiction in North America. Research projects funded by the Alberta Heritage Foundation for Medical Research (AHFMR) have resulted in significant discoveries in the world of medicine and health care. The Medical and Biological Sciences Section assists with the commercial process for these and other technologies in human and animal health care products (drugs, vaccines, diagnostic agents).

The section also assists companies to develop products and processes using biotechnology in agriculture, environment, energy and forestry, and consults with respect to policies and regulations pertaining to the necessary controls.

Medical Devices

The Medical Devices Section is responsible for assisting Alberta's medical device industry to develop and commercialize new health care products used for diagnostic or therapeutic purposes. These include products and equipment specifically designed for hospitals, nursing homes and home health care applications.

The section liaises with medical associations such as Medical Devices Canada (MEDEC) and Alberta Hospital Association (AHA) and works in cooperation with the Alberta Heritage Foundation for Medical Research (AHFMR) to assist companies in commercializing new technologies using the Medical Innovation Program administered by the Foundation.

Initiatives of the past year included active participation in the Industry, Science and Technology Canada (ISTC) Phase III sector campaign on medical devices. Another main activity included initiating, in cooperation with ISTC, the Medical Device Industry Survey with the corporate responses profiled in Health Care Products and Capabilities in Alberta directory published in March 1991.

Information Technologies

The Information Technologies Section is responsible for assisting Alberta's information technologies industry to develop and commercialize new products. Developments of importance include high performance computers; engineering workstations and related applications software (often involving artificial intelligence); expert systems; and multi-media, computer-aided design, drafting and engineering.

Information Technologies also co-operates with computing sector associations including the Alberta Society of Software Developers, Canadian Information Processing Society, the Edmonton and Calgary Advanced Technology Associations, Alberta Chapter of Canadian Advanced Technology Association, Information Technology Association of Canada, the Canadian Association of Data Processing Service Organizations and the Alberta Courseware Producers Association.

In addition, the section co-operated with Communications Canada, Bell and the Canadian Association of Data Processing Service Organization in undertaking a feasibility study for the establishment of a Canadian database industry initiative. There is also continued co-operation with Communications Canada in facilitating the establishment of a federal-provincial joint program for the development of inter-provincial courseware products for schools; in facilitating discussions with the Alberta courseware industry regarding a western courseware marketing initiative; and in facilitating discussions with the petroleum industry and courseware industry regarding a large-scale courseware pilot project.

In March 1991, Information Technologies represented Alberta in a Canadian Infotech mission to Germany. Contacts were established in major research institutes in Germany and a process for future information technology industry collaboration was initiated.

Other activities of the section included co-ordinating the software industry survey for the future Products and Capabilities Directory; participating in the inter-governmental Software Industry Liaison Committee dealing with Software Products Sector Campaign; assisting with corporate introductions for Myrias Research Corporation; assisting with development and approval of Land Related Information Systems; and assisting with plans for establishing a Centre for Information Technology in Alberta.

Advanced Materials and Processes

The family of advanced materials technologies comprise advanced ceramics as well as advanced composites, metals and polymers. Like other strategic technologies, they underpin and anchor the performance of a range of industries. Consequently, they have received national priority and formed a "focus" program in most of the industrialized countries including Japan, United States, Canada, United Kingdom and other Western European countries.

In order to compete successfully, it will be essential that new materials, processing and production technologies be incorporated into Alberta's resource, manufacturing and advanced technology industries. Recognizing the importance of advanced materials technologies, both in the creation of new industries and their impact on supporting advanced technology industries, the province has, as a first step, supported the formation of WESTAIM Technologies Inc., to put Alberta in the forefront of advanced materials technologies.

The Westaim Technology Inc. (W.T.I.) Program is a $140 million project jointly funded by Sherritt Gordon Ltd. and its allies, the Government of Canada and the Government of Alberta. Under the five-year agreement, industrially-strategic applied research will be undertaken leading to the commercialization of new products by Sherritt. It is also anticipated that new materials end-user companies will start up in Alberta as a result of Sherritt's strategic alliances.

In the past year, W.T.I. has completed the construction of the Mackiw Material Research Centre; developed its advanced metals, ceramics, polymers and composites applied research programs; purchased, installed and commissioned laboratory equipment and hired a considerable number of new research staff, including world class principal research team leaders.

W.T.I. is developing ties with Alberta research institutes and universities by way of contract research arrangements.

The section organized three high profile business events over the past year which brought industry, the business community, academia and government agencies together. The focus included polymers, ceramics and resource-based industry technologies.

Manufacturing Technologies

Three concerns of the Manufacturing Technologies Section are: competitiveness, infrastructure and industrial growth. Increasing the international competitiveness of Alberta's existing manufacturing industries through the application of new manufacturing technologies is the section's primary concern. The secondary concern is the development of the infrastructure which supports the diversification of Alberta's local manufacturing community. The third concern is supporting local companies which develop manufacturing equipment.

In surveying Alberta's manufacturing infrastructure it was observed that the province has no recognized formal training programs for its manufacturing professionals such as managers, engineers and technologists. To address this deficiency, the Department supports the Society of Manufacturing Engineers, assists The University of Calgary in developing its Manufacturing Engineering Degree Programs and co-sponsored Alberta's second major manufacturing conference held in September 1991.

During the course of the year, the section also reviewed numerous proposals from the environmental and manufacturing industries' sectors and assisted these companies in developing business plans and seeking financing.

TECHNOLOGY TRANSFER

Technology Transfer finds ways to commercialize inventions, technology know-how and technical information generated by agencies funded by the provincial government or private individuals. This includes working with technology transfer offices at the universities of Alberta and Calgary and Northern Alberta Institute of Technology (NAIT).

This section also encourages provincially funded agencies to buy newly developed advanced technology and processes through the First Purchase Program and encourages Alberta industries to adopt foreign technologies. The section is also involved in importing technology inventions for use by Alberta's industries.

The initiatives of the last year included the provision of significant financial support to the technology transfer offices at the universities of Alberta and Calgary, and the Northern Alberta Institute of Technology. The support enabled these institutions to obtain licenses for technologies such as silver recovery, protein structures, biodegradable plastic, high energy food, anti-cancer compounds, diabetes I vaccine (U of A); human vaccines, hypertension drugs, navigation/positioning systems, corrosion detection system and a sleep apnea device (U of C).

In conjunction with the Licensing Executives Society, and Alberta Economic Development and Trade, the section sponsored technology transfer seminars in Edmonton and Calgary oriented toward the individual inventors. Similar events were also held with the Canadian Industrial Innovation Centre. More than 50 inventors were assisted during the year.

As well, the section helped stimulate the development of university-industry affiliates and encouraged the development of university spin-offs. Some of the university-industry projects included high pressure valves now being manufactured by an Edmonton company, a medical diagnostic kit and a waste treatment process.

In international technology transfer, the section initiated and concluded negotiations on technology acquisition arrangements with Belgium and Hungary. These arrangements enabled Belgian companies from Wallonia and Flanders to engage in technology transfer ventures following their mission to Alberta in the fall of 1990.

INVESTMENT DEVELOPMENT

The prime objective of the Investment Development Section is to promote investment in Alberta's advanced technology sectors.

The section develops and re-inforces an awareness in the Canadian and international business communities of the Alberta Government's commitment to research, development and commercialization of advanced technologies. It encourages investment in advanced technology development by promoting Alberta's programs, facilities and institutions.

The section returned to the American east coast to participate in a major electronics show, Electro '90, held in Boston. West coast exposure was gained at the American Society for Microbiology Exposition held in Anaheim, California and the International Biotechnology Exhibition in San Mateo, California. The section also promoted Alberta's advanced technology industry at the Canadian High Technology Show in Toronto. All these events included joint participation from Alberta companies, institutes and municipal economic development authorities.

In support of Alberta professional and scientific organizations, the section participated in numerous exhibitions in Edmonton and Calgary to promote public awareness of Alberta's advanced technology capabilities and accomplishments.

International delegations from Japan, Korea, Belgium, Indonesia, Finland and France visited the province and were introduced to Alberta's advanced technology infrastructure.

The highlight of the year was a visit to Alberta by a 19-member delegation from the Flanders Region of Belgium, led by President Gaston Geens. At that time, a Memorandum of Understanding on science and technology exchange was signed between Flanders and Alberta.

RESEARCH, POLICY AND PLANNING DIVISION

The Research, Policy and Planning Division provides research, advice and co-ordination in the ongoing development and administration of Alberta Government policy in communications, science and technology.

The Division is responsible for long term planning within the Department and assists in the development of specific sectoral plans for advanced technology industries. It also provides technical, economic, financial and policy advice to support departmental programs and other initiatives.

In addition, the Research, Policy and Planning Division provides support to the Minister in his responsibilities for the administration of the Alberta Research Council Act, Alberta Heritage Foundation for Medical Research Act, Alberta Educational Communications Corporation Act, the Telecommunications Act and the Alberta Government Telephones Reorganization Act.

The Division has administrative responsibility for the delivery of several programs including the Alberta-Heilongjiang Science and Technology Exchange Program, the Conference Grant Program and the Individual Line Service Program.

Telecommunications Policy

On July 5, 1990, the Alberta Government Telephones Reorganization Act received royal assent, allowing for the privatization of the Alberta Government Telephones Commission (AGT), its restructuring under the newly-formed TELUS Corporation, and the August 1990 public issue of $875,000,000 in TELUS shares. The Division was actively involved in the privatization by providing legislative, regulatory and policy input throughout the process.

The privatization of AGT also saw regulatory authority formally ceded to the federal Canadian Radio-television and Telecommunications Commission (CRTC) on October 4, 1990. To secure ongoing and meaningful provincial input into regulatory matters affecting AGT and telecommunications in Alberta, the Minister reached agreement with the federal Minister of Communications through an Exchange of Letters in May, 1990, to ensure public policy priorities be respected by the federal government and the CRTC. This agreement was further strengthened in a formal Memorandum of Understanding signed by the Ministers on March 28, 1991.

Prior to the CRTC assuming regulatory authority, the Minister, with recommendations from the Ministerial Committee on Telecommunications (MCOT), was responsible for approving all AGT filings for service and rate revisions. In 1990-91, 21 filings were approved by the Minister. Among those services approved in 1990-91 were 28 new Extended Flat Rate Calling (EFRC) routes, and the introduction of the Select Route and Special EFRC programs. A general rate increase of $2 per residential subscribers, $4 for business subscribers and long distance rate reductions averaging 17 per cent were also approved. These changes in local rates were AGT's first since 1984.

The Division continued to liaise with its various federal counterparts on other matters affecting telecommunications service in Alberta, including an examination of the establishment of a national high speed data network, database and courseware development initiatives and regulatory issues including frequency spectrum usage, radio license fees, the development of federal telecommunications legislation, and the implementation of the new federal Broadcasting Act.

Reflecting the role of telecommunications as a means to enhance provincial economic development, the Division commissioned a study on the impact of telecommunications in rural development and participated in inter-departmental efforts such as addressing the recommendation of the Minister's Committee on Local Development and examining the feasibility of establishing a province-wide E-911 emergency calling system.

In response to a May, 1990, application to the CRTC by Unitel Communications to provide competitive public long distance service, the Department registered with the CRTC as an intervenor, submitted interrogatories to Unitel and made a presentation of its concerns to the CRTC at a one-day public hearing held in Calgary in March, 1991. Throughout this portion of the proceedings, the Department noted the Government's concern that the introduction of public long distance competition be achieved in a way that does not compromise the availability, affordability and quality of existing telecommunications service.

Western Economic Partnership Agreements

The Division was actively involved in negotiating a Western Economic Partnership Agreement (WEPA) with the federal Department of Communications that would see the federal and provincial governments spend $5 million each, over a number of years, in support of communications technology development activities in Alberta. An agreement in principle was finalized and submitted in March, 1991, for federal Treasury Board approval. The WEPA negotiations began in late 1989, when the federal government indicated to each of the four western provinces that they had received approval from the federal cabinet to negotiate WEPA agreements with the provinces in a number of priority sectors.

Science and Technology Policy

In addition to its involvement in the Forum of Western Ministers responsible for Science and Technology, the Department continued to play an important role as the provincial representative on the Council of Science and Technology Ministers (CSTM) at the national level. The CSTM worked together to further develop the National Science and Technology Framework for Action which was released for consultation in May, 1990. The Forum of Western Ministers continued to work on co-operative projects in areas such as environment and geographic information systems.

The Alberta Government hosted the second annual National Forum of Science and Technology Advisory Councils in Edmonton from May 27-29, 1990. The Advisory Councils from across the country dealt with issues related to science and technology such as:
(1) National R&D Expenditure Objectives,
(2) Capital Formation and Scientific Activity,
(3) Strategies to Enhance Industrial Innovation and
(4) Science and Technology Awareness and Education.

Science and Technology Exchange Program - Alberta/Heilongjiang

The Science and Technology Exchange Program has now been in existence for four years. The program continues to provide an excellent avenue for collaborative efforts between scientists in Alberta and their colleagues from the sister province of Heilongjiang in the People's Republic of China. Last year Chinese scientists worked in Alberta in three areas. Research included the development of new techniques for gene encoding that could lead to production of branched lipids in plant cell membranes which is expected to increase plant resistance to cold.

Work by a second group of scientists indicated possible approaches to prevent catalyst de-activation during conversion of methane to ethylene, propylene and propane. A third Chinese scientist, along with his Alberta colleague, conducted research into low temperature properties of asphalt concrete mixes as they relate to overall thermal cracking of pavement.

In addition to the exchange program with China, Alberta scientists are also involved in three other multi-party research projects with researchers from the provinces of Hokkaido, Japan and Heilongjiang, China. This trilateral cooperation has evolved from the Trilateral Consultations which have taken place between the three provinces. The areas of interest to the three provinces include wheat amelioration, aquaculture and research on building materials in cold climates.

Space-Related Projects

The Department has provided support in co-operation with three other western provincial governments, the federal government and four leading western space companies for the Earth Environment Space Initiative (EESI). EESI is a long-term space program for Canada with a twofold purpose: to provide valuable new and affordable information for environmental monitoring and resource management, and to create an industrial infrastructure for expanded international market share and future EESI small satellite usage. The first phase of the EESI project, the project definition study phase, is scheduled for completion in June 1991. The Department is providing continuous input to the EESI project via its membership on the project steering committee.

The Department continued its participation in Canada's RADARSAT project. RADARSAT is a Canadian-led international joint program to design, construct and operate Canada's first earth observation satellite system. Alberta is participating in policy development and planning guidance on the domestic aspects of the program in matters relating to the acquisition, processing and distribution of the RADARSAT data. The satellite is currently in the development stage. Construction began in 1991 for launch in 1994.

Individual Line Service Program

The Individual Line Service (ILS) Program began in September 1987 when the first rural residents received an individual telephone line in place of a party-line. The ILS conversion program reflects the commitment of the Government of Alberta to make single party line the standard of basic service for all Alberta telephone subscribers.

Upon completion on June 30, 1991, the Program will have provided more than 115,500 subscribers throughout Alberta with private-line service. Over 75 per cent of the cost of the ILS Program is funded by the Government through the Alberta Heritage Savings Trust Fund.

As ordered by the Alberta Public Utilities Board, customers may choose to make a one-time payment to Alberta Government Telephones of $560 or equivalent monthly payments of $5. In keeping with the Government's earlier commitment to provide this service at $450, subscribers receive a rebate of $110 from the ILS Rebate Program. This Program also refunds monthly exchange circuit surcharges to the 26,000 rural customers who acquired private lines before the ILS Program began.

Technology, Research and Telecommunications is responsible both for administering the ILS conversion as well as the Rebate Program.

Trade and Economic Development Initiatives

The Division participated in a number of inter-departmental initiatives, studies and reports dealing with provincial economic diversification strategies, achievements and related issues. In the area of trade, the Division was involved in monitoring a number of international trade developments, specifically the Uruguay Round of GATT negotiations and its possible impact on advanced technology manufacturers and service providers in the province. The Division continued to assess the implementation of the Canada-U.S. Free Trade Agreement and its impact on Alberta's advanced technology industries. The Division was also involved in identifying ways in which industry could continue to maximize the benefits of the Agreement.

Industry and Statistical Research

With the ongoing development of Altatech and other science and technology databases, the Division publishes information and responds to numerous inquiries from the public relating to composite indicators of technology-intensive enterprises, product array, and R&D activities. The Department co-sponsored with Statistics Canada the 1990-91 census of Provincial Government Scientific Activities. Time series data on investments in Alberta's R&D capabilities were provided to several public sector organizations and agencies.

Conference Grant Program

The Department commenced a new program in 1990-91 entitled the Conference Grant Program. This program is designed to provide modest financial support to Alberta-based conferences and seminars which contribute to the development or improvement of research and technology.

The Conference Grant Program supported 14 events in 1990-91. Program funds were instrumental in securing other public and private sector contributions.

The Technology and Research Advisory Committee (TRAC)

The Technology and Research Advisory Committee (TRAC) consists of representatives from government departments involved in technology and research and reports to the Minister of Technology, Research and Telecommunications. TRAC completed a major examination of government research programs across the departments and agencies analyzing the funding, management, co-ordination and program delivery. TRAC also reviewed major provincial and national policy documents and reports, as well as proposals presented to the government for funding. The proposals reviewed included provincial funding for the Alberta nodes in the Network of Centres of Excellence Program, and the Alberta participation in the Canadian Hydrogen Research Program.

FINANCIAL PROJECTS AND ADMINISTRATION DIVISION

Financial Projects and Administration provides analytical support, project appraisal and advice to the Department and Minister on financial aspects of projects funded by Technology, Research and Telecommunications. The Division co-ordinates the provision of legal and contract services to the Department through liaison with the Department of the Attorney General, and is responsible for negotiating, drafting and processing financial agreements and contracts. It also provides administrative support, including Electronic Data Processing (EDP) services and financial advisory services to the Department. The Division establishes and maintains accounting records and procedures, and prepares the annual Departmental budget. It monitors expenditures and contracts entered into by the Department with the private sector.

HUMAN RESOURCES DIVISION

The Human Resources Division develops personnel systems and programs, and provides consultant services to Departmental managers and staff. These programs consist of recruitment and selection, classification and compensation, employee relations, organizational design, human resources planning, and pay and benefits administration. The Division also manages human resources for the Premier's Council on Science and Technology.

CORPORATE AND PUBLIC RELATIONS DIVISION

Corporate and Public Relations manages the flow of information concerning the issues and activities relevant to the Department's mandate. It designs and delivers promotional materials required by other divisions of the Department, and co-ordinates information dissemination on behalf of the Minister and the Department.

Corporate and Public Relations also works with advanced technology facilities, institutes and organizations to meet our mutual communications goal of creating greater public awareness and understanding of the challenges and achievements of the sector.

To help meet its goal of creating a science culture in Alberta, Corporate and Public Relations co-ordinates Alberta's Science and Technology Week and plays a key role in the Alberta Science and Technology Leadership (ASTech) Awards. The Division conducted the Department's Science City Campaign to raise the level of understanding of the scope and scale of science and technology in Alberta as well as continuing its activity in its Student Awareness Program.

Science City Fund

Corporate and Public Relations administers The Science City Fund, a grant fund which supports projects that stimulate an interest in and an understanding of the role and impact of science and technology. During this year, the Fund supported eleven projects, the majority of which had students as their primary focus. For some projects, Science City Fund support was integral in leveraging funding from the federal government's Science Culture Canada Program.

SCIENCE AND TECHNOLOGY CAREERS

Interactive Technology for Education/Employment/ Career (ITEC)

The Interactive Videodisc System on Careers in Science and Technology (ITEC) project involves the development of two interactive videodisc systems (within a series of six) to create awareness of and motivation for career paths in advanced technology occupational sectors. With financial support from the Department and other sources, the ITEC project is being co-ordinated by the Centre for Career Development Innovation, located at Edmonton's Concordia College. The first videodisc will offer an overview of career opportunities in five advanced technology sectors: environment, computers, health, electronics/telecommunications and advanced materials/processes. The second videodisc will examine environmental roles in detail. The presentations will be targeted to youth (ages 13 to 24) and designed for use in schools, career resource/counselling centres, exhibitions, trade fairs and industry sites.

Science Alberta Foundation

The Department, along with the Alberta Lottery Fund, was instrumental in providing financial support to establish the Science Alberta Foundation, a new science network proposed for the province. The Foundation began a two-year pilot project aimed at fostering a greater awareness among all Albertans about science and technology and to encourage young Albertans to investigate careers in science and technology. Acting as a catalyst to stimulate and support community science initiatives, the Foundation is focused on developing partnerships among communities, industries and educators to deliver new, innovative and responsive programs of informal science education.

PREMIER'S COUNCIL ON SCIENCE AND TECHNOLOGY

The Premier's Council on Science and Technology was formed in May 1990, bringing together 20 individuals representing Alberta's research community, advanced technology industry, academia and business to act as advisors to the Government on science and technology issues facing Alberta in the future.

The Council is chaired by Premier Don Getty, who is supported by vice-chairmen Hon. Fred A. Stewart, Minister of Technology, Research and Telecommunications, and Dr. Robert Church of The University of Calgary. The Council's scope of responsibilities focused on advising the Government on several key issues including:

- science and technology as they relate to economic and social development and to enabling Alberta to compete effectively in the global marketplace;
- the resources within and outside the Government that should be devoted to the development of science and technology and recommending guidelines for the allocation of those resources; and
- the objectives of a science and technology development policy.

During the year, the Premier's Council formed four specialized sub-committees to address aspects of these issues in detail. The sub-committees considered matters relating to enhancing the science and technology culture in Alberta, Alberta in the future and the role of science and technology, Government support for science and technology and network strategy related to science and technology.

In addition, members of the Premier's Council on Science and Technology represented Alberta at the National Forum of Science and Technology Advisory Councils held in Edmonton from May 27-29, 1990. This forum is held annually and is a meeting of all provincial and national advisory councils.

FINANCIAL STATEMENT

Budget Estimates and Expenditures Classified by Vote, Sub-Program and Element

Vote 1	**Development and Commercialization of Advanced Technologies**	**1990 - 91 Budget Estimates (includes special warrants)**	**Expenditures for the year ending March 31, 1991 (unaudited)**
1.0.1	Minister's Office	$237,158	$258,488
1.0.2	Deputy Minister's Office	205,434	194,367
1.0.3	Financial and Administrative Services	897,468	809,141
1.0.4	Research, Policy and Planning	1,484,855	1,481,617
1.0.5	Business Development and Marketing	1,290,545	1,101,980
1.0.6	Investment Development	343,478	207,615
1.0.7	Corporate and Public Relations	1,341,325	1,346,197
1.0.8	Human Resources	104,804	105,158
1.0.9	Premier's Council on Science and Technology	545,000	503,042
	TOTAL	**$6,450,067**	**$6,007,605**
Vote 2	**Financing of Technology and Research Projects**		
2.1	Infrastructure Development and Support		
2.1.1	Biotechnology	-	-
2.1.2	Electronics/Microelectronics	$2,373,500	$2,373,500
2.1.3	Telecommunications/Information Services	778,433	838,433
2.1.4	Computer and Software	-	-
2.1.5	Technologies	-	-
2.1.6	Advanced Materials/Processes	11,100,000	11,100,000
2.1.7	Advanced Tech. and Engineering Support	1,001,000	1,001,000
2.1.8	Medical Research Support	370,000	370,000
	Total Sub-Program	**$15,622,933**	**$15,682,933**
2.2	Commercialization of Advanced Technologies		
2.2.1	Biotechnology	6,400,000	6,737,629
2.2.2	Electronics/Microelectronics	-	397,585
2.2.3	Telecommunications/Information Services	-	-
2.2.4	Computers and Software	-	753,642
2.2.5	Technologies	-	140,235
2.2.6	Advanced Materials/Processes	3,000,000	3,080,209
2.2.7	Emerging Technologies	2,761,000	608,522
2.2.8	Medical Innovation	2,333,000	2,333,000
	Total Sub-program	**$14,494,000**	**$14,050,822**
	TOTAL	**$30,116,933**	**$29,733,755**

PROVINCIAL GOVERNMENT SCIENTIFIC ACTIVITIES, 1990-91

OVERVIEW

RESEARCH AND DEVELOPMENT (R&D) AND RELATED SCIENTIFIC ACTIVITIES (RSA) EXPENDITURES

Technology, Research and Telecommunications, in co-operation with Statistics Canada, conducts an annual survey of provincial government departments and agencies which perform research and development and/or related scientific activities. This report stems from the 1990-91 survey and provides a brief overview of its results. Please note that although these results follow after only one of two audits by Statistics Canada they are still representative of the final data.

The data from the science survey is based on each respondent's interpretation of definitions and methods of calculation. While these are still estimates, they are a good indicator of the year's expenditures. However, the reader should be cautioned when drawing conclusions from the data and should be made aware of an estimated level of confidence of 15 per cent.

For additional information please contact:

Research and Planning
Alberta Technology, Research and
Telecommunications
12th Floor, 10909-Jasper Avenue
Edmonton, Alberta
T5J 3L9,
(403) 422-0567.

After a three-year decline in provincial science expenditures the 1990-91 fiscal year saw an increase of 8.4 per cent from the previous year. Furthermore, research and development expenditures have increased by 13.6 per cent, the first increase since 1986-87. This helped to generate a slight increase in the percentage of dollars spent on research and development relative to the total science expenditure. The overall increase was caused by a $24.4 million (12.3 per cent) growth in the natural sciences which more than offset the $3.7 million (7.5 per cent) decline in the social sciences. Table 1 provides a five-year historical outlining several types of expenditures.

Increases in the 1990-91 natural science dollars came primarily from budget jumps in Alberta Oil Sands Technology and Research Authority; Technology, Research and Telecommunications and Forestry, Lands and Wildlife of $13.9 million, $6.4 million and $3.1 million respectively. These increases were mainly in the form of disbursements to universities, industry and intramural activities. One other significant change was a $2.7 million drop in Energy's science budget, which was absorbed by industry.

The departments exhibiting a decrease in the social science expenditures were Advanced Education and the Solicitor General. Advanced Education's budget dropped by $1.3 million while the Solicitor General's dropped by $2.5 million. These decreases primarily affected the areas of industry and universities.

Table 1 Annual Science Expenditures of the Provincial Government, 1986/87-1990/91

Expenditure	1986/87	1987/88	1988/89	1989/89	1990/91
			($ millions)		
Total	333.4	254.2	248.7	247.3	268.1
Natural	289.0	213.1	206.3	198.1	222.5
Social	44.4	41.0	42.3	49.2	45.5
R&D	251.9	172.7	150.1	148.2	168.4
RSA	81.5	81.5	98.6	99.1	99.7
			(per cent)		
Natural	86.7	83.8	83.0	76.5	83.0
R&D	75.6	67.9	60.4	60.0	62.8

OBJECTIVES OF R&D AND RSA EXPENDITURES

Industrial and Economic Development, and Energy and Fuels were the main objectives of the 1990-91 provincial science survey. Although these represented only two of the 10 objectives in the survey, together they accounted for 39 per cent of the year's science expenditures. In addition, these two objectives focused mainly on research and development, providing 51 per cent of the total research and development expenditures. Other dominate objectives were Health, Social Development and Environmental Issues. As Table 2 shows, each of these three accounted for approximately 14 per cent of total expenditures.

Industrial and Economic Development, as in previous years, has maintained the largest share of expenditures, claiming 22 per cent of all provincial science dollars. Of this share, two sub-components, Agriculture and Manufacturing, comprised 83 per cent of this objective.

Under the Energy and Fuels objective the only contributors were the Alberta Oil Sands Technology and Research Authority (AOSTRA) and Alberta Energy, with AOSTRA comprising 86 per cent of this objective. Over 95 per cent of Energy and Fuels' science dollars were directed towards fossil fuels.

The Alberta Heritage Foundation for Medical Research was the primary contributor to Health objectives, providing 75 per cent of these expenditures. Combined with the 19 per cent provided by the Department of Health, these two organizations accounted for all but six per cent of this objective.

Social development issues were mostly undertaken by the Department of Culture and Multiculturalism. Social development directed almost all of its resources towards related scientific activities (RSA), over 95 per cent. The sub-component Culture, Sports and Recreation dominated 58 per cent of this issue.

As with Social Development, Environmental issues focused on RSA. In fact, 71 per cent of these dollars were directed towards RSA. The Departments of Environment and Forestry, Lands and Wildlife financed the bulk of this objective, contributing 53 and 47 per cent respectively.

TABLE 2. OBJECTIVES OF SCIENCE EXPENDITURES ($'000's)

Objective	R&D	RSA	Total	Percent
Advancement of Science	7,013	1,970	8,983	3.4
Communications	-	-	-	-
Energy and Fuels				
Conservation	-	-	-	
Fossil Fuels	38,935	2,420	41,355	
Hydro Electric Energy	-	-	-	
Renewable Resources	1,458	556	2,014	
Other	60	-	60	
Sub-Total	**40,453**	**2,976**	**43,429**	**16.2**
Environmental Issues				
Air	1,502	2,935	4,437	
Land	5,114	679	5,793	
Water	2,510	1,543	4,053	
Other	1,734	21,355	23,089	
Sub-Total	**10,860**	**26,512**	**37,372**	**13.9**
Health	33,959	5,575	39,534	14.7
Industrial and Economic Development				
Agriculture	13,979	7,178	21,157	
Fisheries	15	106	121	
Forestry	3,883	1,011	4,894	
Manufacturing	25,956	2,469	28,425	
Minerals	-	-	-	
Other	1,839	3,525	5,364	
Sub-Total	**45,672**	**14,289**	**59,961**	**22.4**
Social Development				
Culture, Sports & Recreation	-	22,864	22,864	
Education	105	3,249	3,353	
Human Resources	-	2,795	2,795	
Urban & Regional Studies	303	2,150	2,453	
Other	804	6,919	7,723	
Sub-Total	**1,212**	**37,977**	**39,189**	**14.6**
Transportation	2,308	7,339	9,647	3.6
Wildlife	132	1,967	2,099	0.8
Other	27,556	300	27,856	10.4
TOTAL	**169,165**	**98,905**	**268,070**	**100.0**

TOTAL EXPENDITURES BY DEPARTMENT/AGENCY AND PERFORMER

Of the 26 respondents to the 1990-91 survey, the top three science budgets; Technology, Research and Telecommunications (TR&T), Alberta Oil Sands Technology and Research Authority (AOSTRA) and The Alberta Heritage Foundation for Medical Research (AHFMR), provided almost half of the total provincial science expenditures. Collectively, these three organizations concentrated their efforts towards universities, industry and provincial research organizations (Alberta Research Council).

Of the six performers indicated on Table 3, intramural activities accounted for the greatest share of science dollars, a total of 38 per cent. Of the extramural performers, industry captured 26 per cent, universities 15 per cent, provincial research organizations 13 per cent, 'other' six per cent and hospitals one per cent.

AOSTRA was the dominate contributor to industry, particularly towards fossil fuels, providing 44 per cent of these science dollars. Following closely behind in this area was TR&T who provided 31 per cent of the dollars to industry.

The greatest funder of universities was the AHFMR. The AHFMR contributed 87 per cent of its science budget towards universities which translated to 63 per cent of all provincial funds to universities.

With respect to provincial research organizations, TR&T expended 49 per cent of its science budget to this performer. This represented 78 per cent of provincial funds to the Alberta Research Council (ARC).

TABLE 3: TOTAL EXPENDITURES BY DEPARTMENT/AGENCY AND PERFORMER ('000S)

Dept/Agency	Intram	Ind.	Univ.	Hosp.	ARC	Other	Total
TR&T	1,081	21,433	5,517	370	27,411	394	56,206
AOSTRA	4,995	31,055	4,225	-	4,456	1,354	46,085
AHFMR	1,555	1,086	25,719	-	-	1,249	29,609
Forestry	18,421	4,143	351	-	1,249	394	24,558
Culture	17,578	-	-	-	-	5,278	22,856
Agriculture	13,984	841	2,053	-	-	4,279	21,157
Environment(1)	15,709	2,100	116	-	494	1,368	19,787
Trans. & Util.	8,011	367	120	-	313	636	9,447
Health	3,170	940	1,442	1,816	-	-	7,368
Energy	929	2,781	839	-	1,115	336	6,000
Municipal Affairs	2,538	896	82	-	8	7	3,531
Economic Dev. & Trade	1,877	1,056	25	-	3	399	3,360
Solicitor General	1,488	1,049	-	-	-	-	2,537
Treasury	2,085	174	-	-	-	-	2,259
Tourism	1,040	748	-	-	-	249	2,037
Career Dev. & Employment	1,219	577	-	-	-	164	1,960
Education	1,094	115	28	-	-	668	1,905
Labour	1,256	265	-	-	-	57	1,578
Advanced Educ.	1,174	-	-	-	-	100	1,274
Environment Council	1,221	-	-	-	-	-	1,221
Family & Social Services (2)	847	100	24	-	-	124	1,095
AADAC	899	-	-	-	-	-	899
OH&S	611	25	95	-	-	-	731
Attorney General	-	-	303	-	-	-	303
Recreation & Parks	17	116	-	-	29	-	162
ACCESS	145	-	-	-	-	-	145
Total	**102,944**	**69,867**	**40,939**	**2,186**	**35,078**	**17,056**	**268,070**

1: includes the Department of Environment and the Environmental Centre

2: obtained from the estimates of the 1989/90 survey

SCIENCE PERSONNEL ENGAGED IN RESEARCH ACTIVITIES

Measured in person-years, in-house scientific personnel are categorized as technical, science and professional, or "other". These individuals perform R&D, RSA or Administration of Extramural Activities (AEP).

The majority of 1990-91 scientific personnel belonged to one of five departments, Agriculture, Culture and Multiculturalism, Forestry, Lands and Wildlife, Transportation and Utilities, or Environment. These five departments accounted for 78 per cent of all personnel. Consequently, these organizations were the ones which produced the highest intramural costs.

As indicated on Table 4, the bulk of provincial science personnel concentrated on RSA, absorbing over 72 per cent. Of the 22 per cent of science personnel engaged in R&D most were involved in the natural sciences and engineering. Provincial science employees engaged in the AEP accounted for six per cent of the total science labour force.

TABLE 4. PROVINCIAL PERSONNEL ENGAGED IN SCIENTIFIC ACTIVITY

Dept/Agency	**R&D**	**RSA**	**AEP**	**Total**
Agriculture	141.0	272.0	12.0	425.0
Culture and Multiculturalism	-	275.5	-	275.5
Environment	184.5	157.7	2.3	344.5
Forestry, Lands and Wildlife	43.3	244.8	40.2	328.3
Transportation and Utilities	14.1	136.5	1.4	152.0
Other	56.7	314.0	60.1	430.8
Total	**439.6**	**1,400.5**	**116.0**	**1,956.1**

TECHNOLOGY, RESEARCH
AND TELECOMMUNICATIONS

Printed on Recycled Paper